DOCUMENT RESUME

ED 257 686 SE 045 783

AUTHOR Johnson, Charles C.; Hodak, Gary W.
TITLE TRAX (Disk Sector Utility Program). Technical Memorandum 84-1. Focus on the Trained Person.
INSTITUTION Naval Training Equipment Center, Orlando, Fla. Training Analysis and Evaluation Group.
PUB DATE Jul 84
NOTE 36p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Computers; *Computer Software; *Computer Storage Devices; *Magnetic Tapes; Material Development; *Programing
IDENTIFIERS *Byte Reorganization

ABSTRACT

A disk sector utility program (called TRAX) was designed and developed since a computer aid capable of inspecting and modifying the byte data on a disk platter, independent of any other program or system, was not commercially available. This report: (1) provides an overview of the TRAX system; (2) briefly describes the major system options; and (3) contains a guide to operating the TRAX utility. (JN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED257686

TAEG

TRAINING ANALYSIS AND EVALUATION GROUP

TECHNICAL MEMORANDUM 84-1

TRAX
(DISK SECTOR UTILITY PROGRAM)

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

JULY 1984

FOCUS ON THE TR[illegible]SON

DISTRIBUTION LIMITED TO U.S. GOVERNMENT AGENCIES AND THEIR CONTRACTORS: ADMINISTRATIVE/OPERATIONAL USE (JULY 1984). OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO COMMANDING OFFICER, NAVAL TRAINING EQUIPMENT CENTER (CODE 1), ORLANDO, FL 32813-7100.

SE 045 783

TRAINING ANALYSIS AND EVALUATION GROUP
ORLANDO, FLORIDA 32813

Technical Memorandum 84-1

TRAX
(Disk Sector Utility Program)

Charles C. Johnson
Gary W. Hodak

Training Analysis and Evaluation Group
Naval Training Equipment Center
Orlando, FL 32813-7100

July 1984

GOVERNMENT RIGHTS IN DATA STATEMENT

Reproduction of this publication in whole or in part is permitted for any purpose of the United States Government.

T. W. McNaney

T. W. McNANEY, Director
Training Analysis and Evaluation Group

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1 REPORT NUMBER Technical Memorandum 84-1	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4 TITLE *(and Subtitle)* TRAX (Disk Sector Utility Program)		5. TYPE OF REPORT & PERIOD COVERED 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Charles C. Johnson and Gary W. Hodak		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Training Equipment Center Department of the Navy Orlando, FL 32813		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE July 1984 13. NUMBER OF PAGES 37
14 MONITORINC AGENCY NAME & ADDRESS*(if dif rent from Controlling Office)*		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/ DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Distribution limited to U.S. Government agencies and their contractors: Administrative/Operational use (July 1984). Other requests for this document shall be referred to Commanding Officer, Naval Training Equipment Center (Code 1), Orlando, FL 32813.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Utility Program
Byte Reorganization
Magnetic Disk

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This report presents the TRAX system which was designed to aid programmers and system operators with inspection and modification of the byte data on a disk platter. An overview of the TRAX is provided. The major system options are described. The report also contains a guide to operating the TRAX utility.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

S/N 0102-LF-014-6601

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

BEST COPY AVAILABLE

TABLE OF CONTENTS

Section		Page
I	INTRODUCTION	7
	Purpose	7
	Organization of this Report	7
II	OVERVIEW OF THE TRAX UTILITY	9
	System Options	9
III	TRAX OPERATING PROCEDURES	11
	ASCII Modify Option	15
	HEX Modify Option	17
	Skip Option	18
	Link Option	19
	Find a String Option	21
	Replace Option	27
	Position Option	28
	Translation Option	29
	Mode Option (Disk-Relative-Absolute)	33
	%Pause Option	34
	Pointer Option	35
	Dump/Printer Option	36
	Exit Option	37

LIST OF ILLUSTRATIONS

Figure		Page
1	Special function key operations	14

BEST COPY AVA

SECTION I

INTRODUCTION

Computer software development is a complex and, often, tedious task. During normal operations, it is not uncommon to encounter some magnetic disk problems. These problems may result from hardware problems, programming errors, and changing requirements, or program misuse or abuse. Normally, correction of these problems involves byte reorganization on the disk or some modification (addition, deletion, or correction) of a file on the disk.

The need for a computer aid capable of inspecting and modifying the byte data on a disk platter, independent of any other program or system, was recognized by the Training Analysis and Evaluation Group (TAEG) during development efforts for the Chief of Naval Education and Training Automated Budget System (CABS) and the Chief of Naval Education and Training Automated Manpower Reporting System (CAMPRS). Efforts were initiated to obtain a commercially-produced program to meet requirements; however, none were available. Consequently, a disk sector utility program, called TRAX, was designed and developed. The TRAX system evolved slowly because of modifications that were needed to solve both current and expected future disk problems of other systems and application software in use, or under development, by TAEG. TRAX is currently a working utility program in use by the computer community supported by TAEG.

PURPOSE

This report presents the TRAX system and provides a guide on how to operate the utility.

ORGANIZATION OF THIS REPORT

In addition to this introduction, the report contains two additional sections. Section II provides an overview of TRAX and briefly describes the major system options. Section III is a guide to the operation of the TRAX utility.

BEST COPY AVAILABLE

SECTION II

OVERVIEW OF THE TRAX UTILITY

This section presents an overview of the TRAX utility. The major features of the utility are identified and a brief discussion of the functions of each available user option is provided.

The TRAX utility program consists of several disk-related subprograms. It is written in BASIC-2 and designed to operate on a WANG 2200 MVP within a 56K partition. The program was designed to aid programmers and system operators with inspection and modification of the byte data on a disk platter. The system was designed to be interactive and user oriented; however, the system was not designed for, nor intended to be operated by, the casual user. A certain degree of computer systems knowledge and sophistication is required if the system is to be used correctly and successfully.

SYSTEM OPTIONS

The following options are available in the TRAX system:

ASCII modify	allows the user to modify a sector in ASCII.
Exit	allows the user to exit the TRAX program.
Dump/printer	allows the user to print the current sector being viewed.
Find string	allows the user to locate a specified string.
Hex modify	allows the user to modify a sector in hexadecimal.
Link sectors	allows the user to jump according to a link pointer to another sector or record.
Mode	allows the user to change the disk address and/or the Relative or Absolute mode.
%pause	allows the user to refresh the normal viewing screen approximately once each minute.
↑point	allows the user to place pointers at any byte on the screen for easier viewing.

Position	allows the user to locate the position of the sector currently being viewed or the description of a file if its name is in the catalog while using the find string option.
Replace	allows the user to replace a located string with another string of the user's choice. This option can only be used in conjunction with the find string option.
Skip sectors	allows the user to jump forward or backward by a specified number of sectors.
Translate	allows the user to perform various translations and calculations.

The remainder of this report is a tutorial presentation on the use of TRAX and its various system options.

SECTION III

TRAX OPERATING PROCEDURES

It is assumed that the required computer hardware (CRT, disk drive) is available to the person intending to use the TRAX program. Initializing the equipment is an extremely easy task. However, because of the many possible equipment configurations, it is desirable that personnel knowledgeable in WANG equipment set up the program for subsequent use. After loading and starting the execution of program TRAX, the following screen will appear.

```
T R A X      Disk Address          :365


                  welcome Chazz previous user was yourself

    This program tracks, displays, and modifies mag. disk sectors on a WANG
    2200-MVP system.  It was designed for use by the TAEG computer annex at
    NTC Orlando, Fl and can be hazardous if used improperly.  cj a/7914609
```

(Note: The TRAX program can be used with a start program that passes the name of the user in a common global variable '@Z1$' dimensioned eight characters long, it stores up to 10 users and information on where each user was in TRAX when they last exited it.)

The user can now enter the address of the disk he has an interest in or the disk address of the file he wishes to inspect. The user presses RETURN if the default address is correct and the following screen will appear:

```
T R A X      Disk Address          :365          Absolute or Relative


                  welcome Chazz previous user was yourself

    This program tracks, displays, and modifies mag. disk sectors on a WANG
    2200-MVP system.  It was designed for use by the TAEG computer annex at
    NTC Orlando, Fl and can be hazardous if used improperly.  cj a/7914609
```

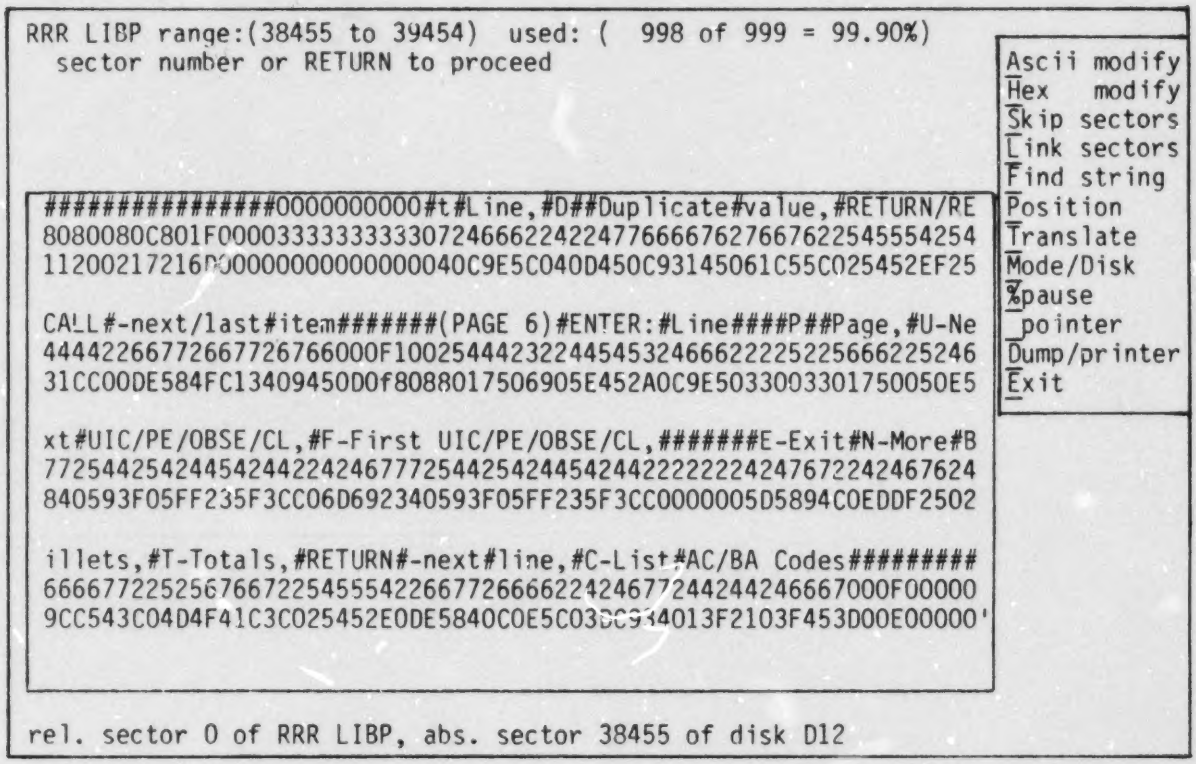
The user must now enter an "A" for Absolute mode or an "R" for Relative mode or Special Function key 15 (SF'15) to return to the disk address. The Absolute mode is selected when the user is not sure which sectors need to be inspected. The Relative mode is selected if the user knows which file is to be inspected. If the Absolute is chosen, the first sector of the disk platter is defaulted to and the user can inspect any sector on the disk regardless of file. If Relative is chosen, the user is prompted to enter the name of the file to be inspected and the following display appears:

```
T R A X     Disk Address        :365        file name: _____________


                  welcome Chazz previous user was yourself

     This program tracks, displays, and modifies mag. disk sectors on a WANG
     2200-MVP system.  It was designed for use by the TAEG computer annex at
     NTC Orlando, Fl and can be hazardous if used improperly.  cj a/7914609
```

Once a valid file name is entered, the first sector of the file is defaulted to. If the user had been previously inspecting this file and the user exited the program, the default sector will be the one that was being inspected at the time of exit.

The next screen to appear is the normal viewing screen, which lists the available options along the right side. All the options that are available at any given time in TRAX are listed here. If an option is not available, it will not be listed.

The normal viewing screen is displayed next.



In addition to the options available, the user may press RETURN and proceed to the next sector, or enter any sector number to proceed to that sector. Special Function keys 4 through 7 and 11 through 14 may also be used to move forward and backward. Table 1 provides a quick reference for using the Special Function keys. TRAX will check the validity of all sector numbers. In a Relative mode only sector numbers within the file in question are valid and the sector numbers are relative to that file. In an Absolute mode all sectors up to the current end of the disk are valid.

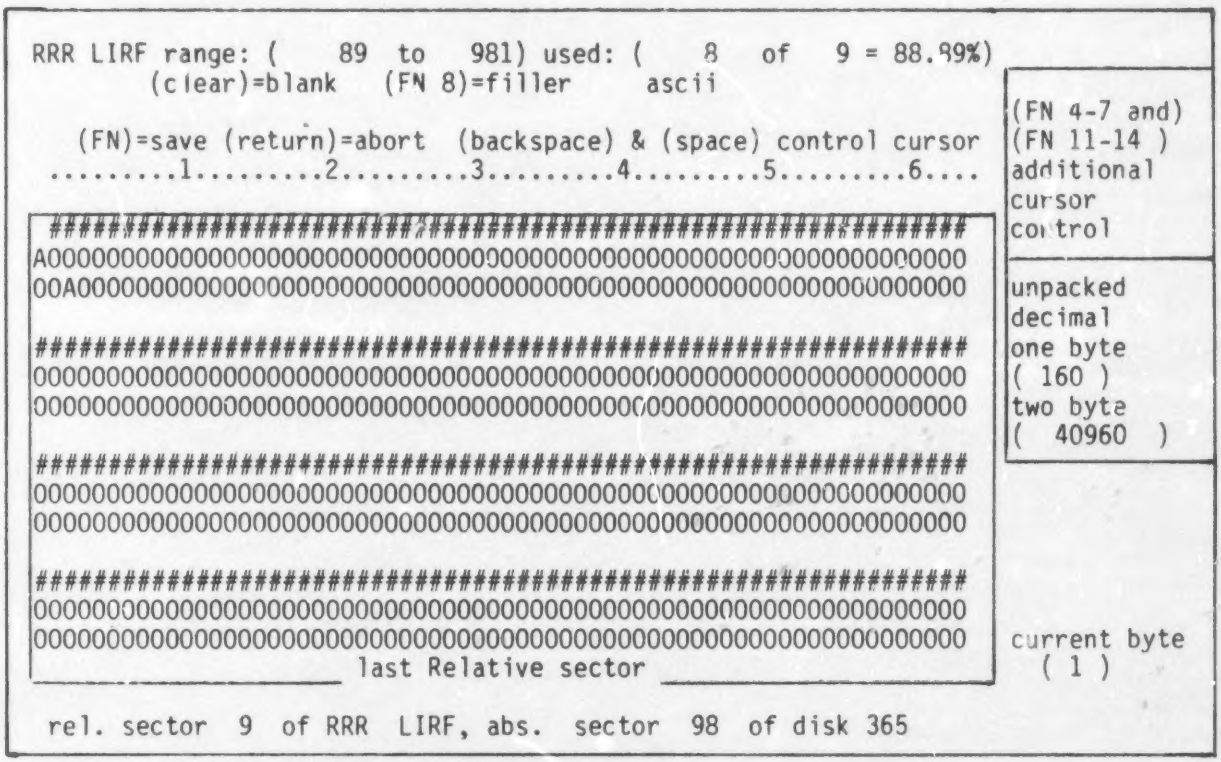
SF 4	In the Relative mode the last sector of the file is displayed.
SF 5	In the Relative or Absolute mode proceed to the next sector.
SF 6	In the Relative or Absolute mode proceed to the previous sector.
SF 7	In the Relative mode the first sector of the file is displayed.
SF 11	In the Relative or Absolute mode proceed forward five sectors.
SF 12	In the Relative or Absolute mode proceed to the next sector.
SF 13	In the Relative or Absolute mode proceed to the previous sector.
SF 14	In the Relative or Absolute mode proceed backward five sectors.

A description of the options available with TRAX is provided in the remainder of this section. The options are presented in their order of occurrence on the CRT. Detailed procedures for operating each option are provided.

Figure 1. Special function key operations.

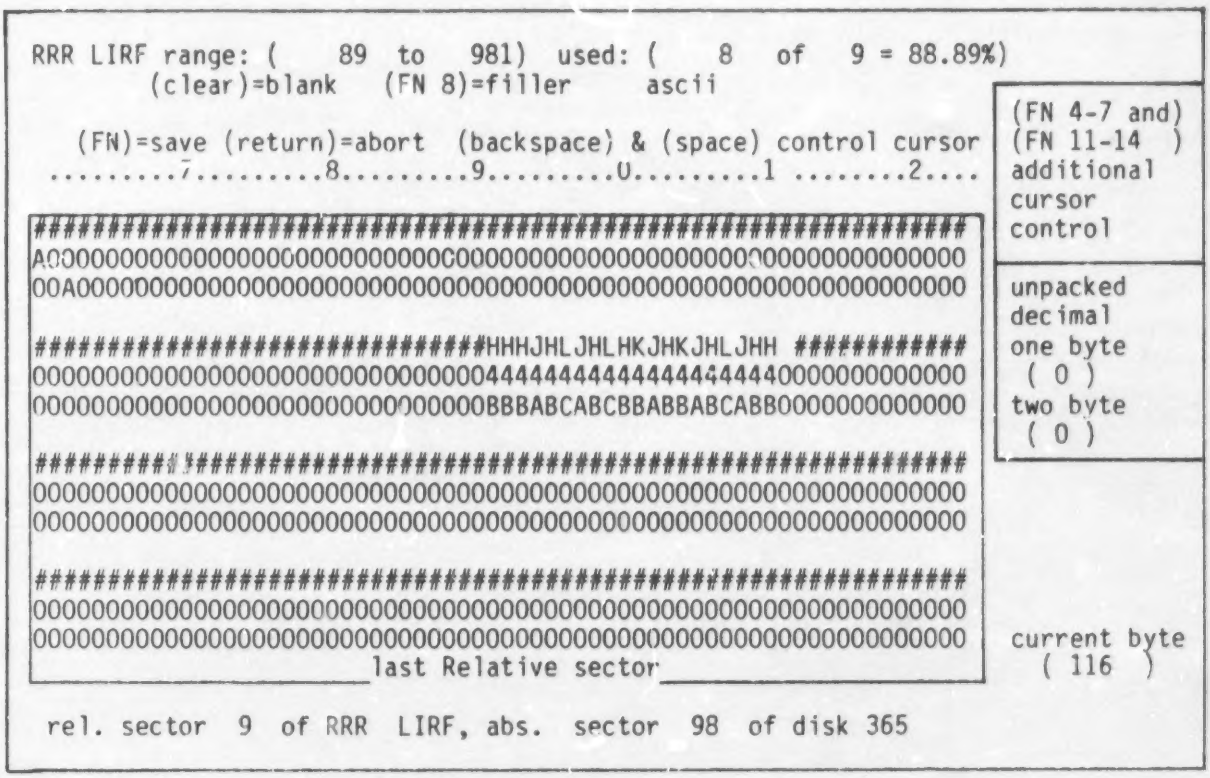
ASCII MODIFY OPTION

Selecting the ASCII Modify Option will cause the system to display:



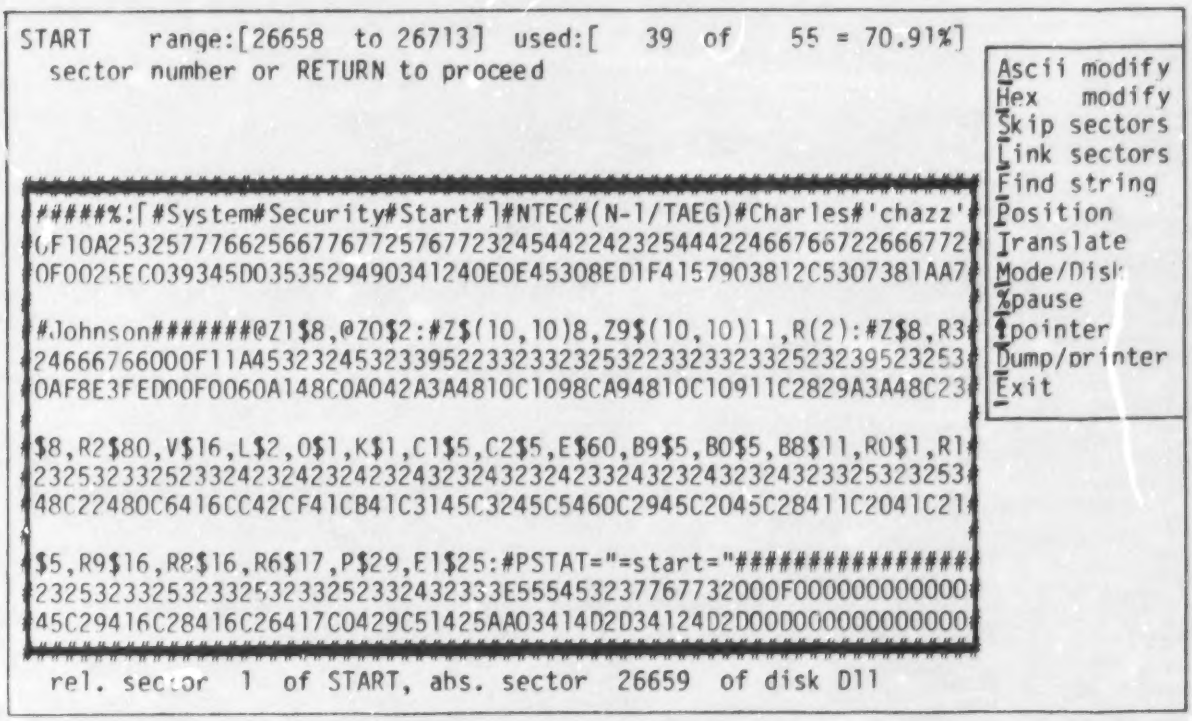
This option allows the user to modify the ASCII portion of a sector. Once an "A" is entered at the prompt at the top of the screen, the available options will appear. The user can control the cursor with Special Function keys 4 through 7 and 11 through 14 or with the SPACE and BACKSPACE keys. The CLEAR key will cause a blank space (HEX(20)) where the cursor is positioned. All changes are made by typing over what appears on the screen. The FN key will save all changes that have been made, the RETURN key will abort the ASCII Modify Option without saving any changes and return the user to the normal viewing screen. Special Function key 8 allows the user, while in the ASCII Modify Option, to modify more than one hexadecimal byte with some common hexadecimal. Once Special Function key 8 is entered, a prompt will appear at the top right side of the screen for the hexadecimal code to be entered. After a valid hexadecimal code is entered, a prompt will appear for the start byte and then the end byte to be filled with this hexadecimal.

If a blank is entered at any of these prompts, the user is returned to the previous prompt. The unpacked decimal value of the current one and two byte position is displayed on the right side of the screen for the users convenience.


RRR LIRF range: (89 to 981) used: (8 of 9 = 88.89%)
(clear)=blank (FN 8)=filler ascii
(FN)=save (return)=abort (backspace) & (space) control cursor
(FN 4-7 and) (FN 11-14) additional cursor control
unpacked decimal one byte (0) two byte (0)
current byte (116)
last Relative sector
rel. sector 9 of RRR LIRF, abs. sector 98 of disk 365

HEX MODIFY OPTION

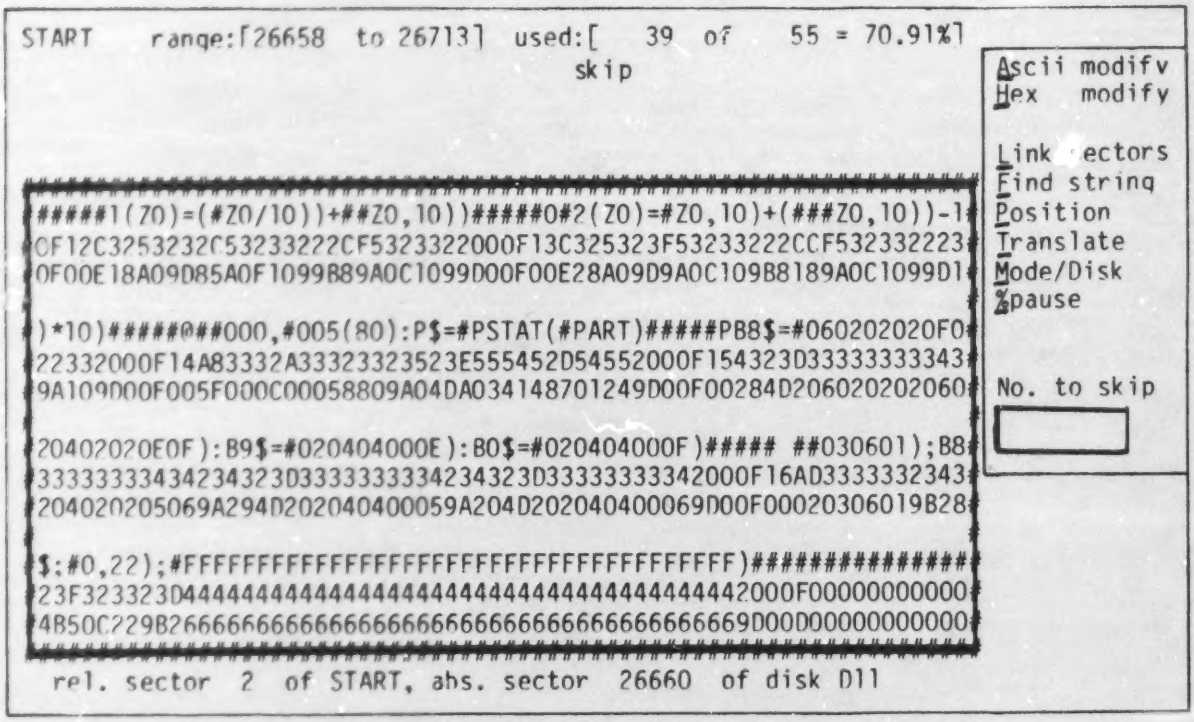
Selecting the HEX Modify Option will cause the system to display:



This option is exactly like the ASCII Modify Option, except the hexadecimal portion of a sector is being modified and the CLEAR key is disabled. Once an "H" is entered at the prompt at the top of the screen, the options available to aid in the modification will appear.

SKIP OPTION

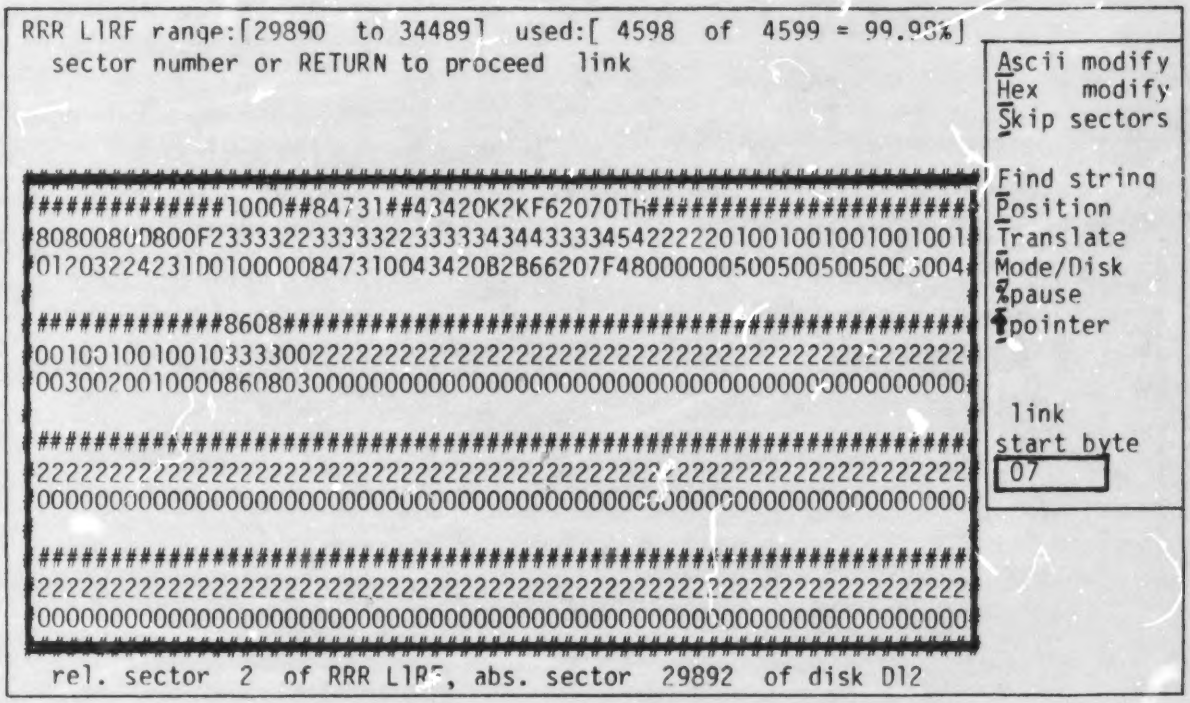
Selecting the Skip Option will cause the system to display:



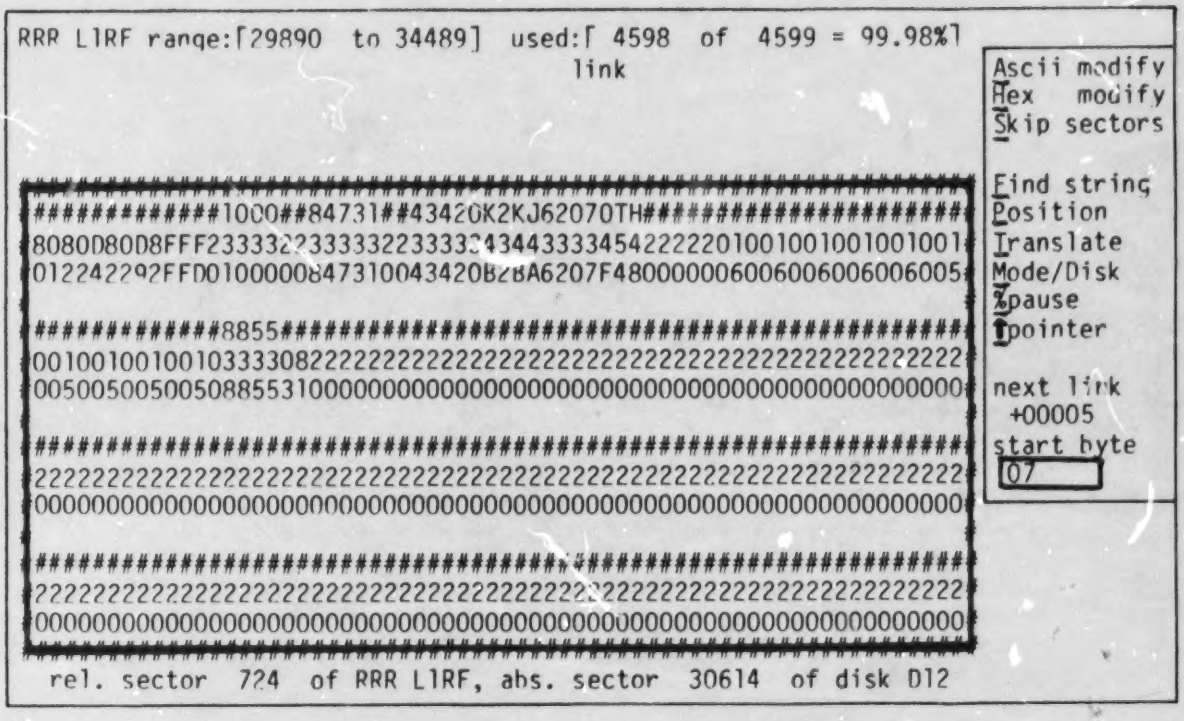
This option allows the user to skip or jump any number of sectors specified, forward or backward, in a file or on a disk. Once an "S" is entered at the top of the screen, a prompt will appear on the right side asking for the number of sectors to skip. If nothing is entered, the prompt will return to the top of the screen. If a negative value is entered, the skip will be backwards.

LINK OPTION

Selecting the Link Option will cause the screen to display:

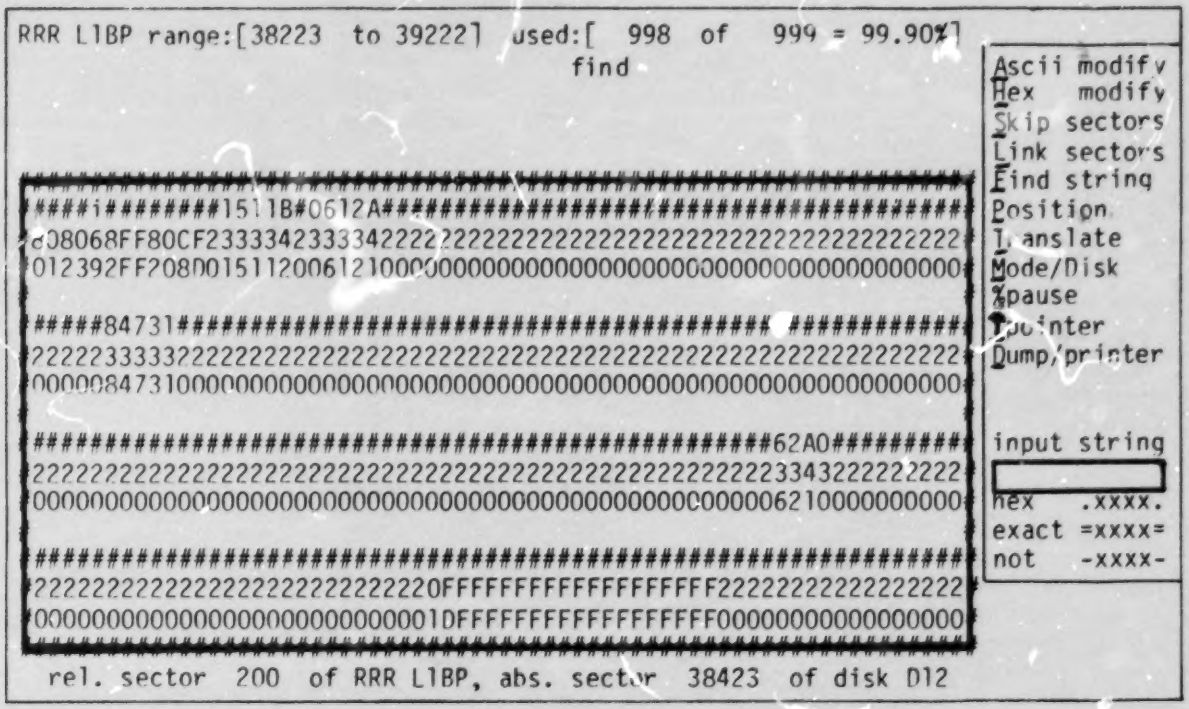


This option allows the user to follow a link structured data file where the link pointer bytes must be two bytes long. Once an "L" is entered at the prompt at the top of the screen, a prompt will appear on the right side asking for the start byte of the link pointer in the sector currently being viewed. If nothing is entered, the prompt will return to the top of the screen. Once a legal start byte is entered, the next sector linked to will appear with the relative position of the next link in a prompt line above the start byte prompt. A blank can be entered here and the prompt will return to the top of the screen or this number can be altered to deviate from the link pointer. If the number is unaltered, pressing RETURN will display the next linked sector as shown on the next screen.

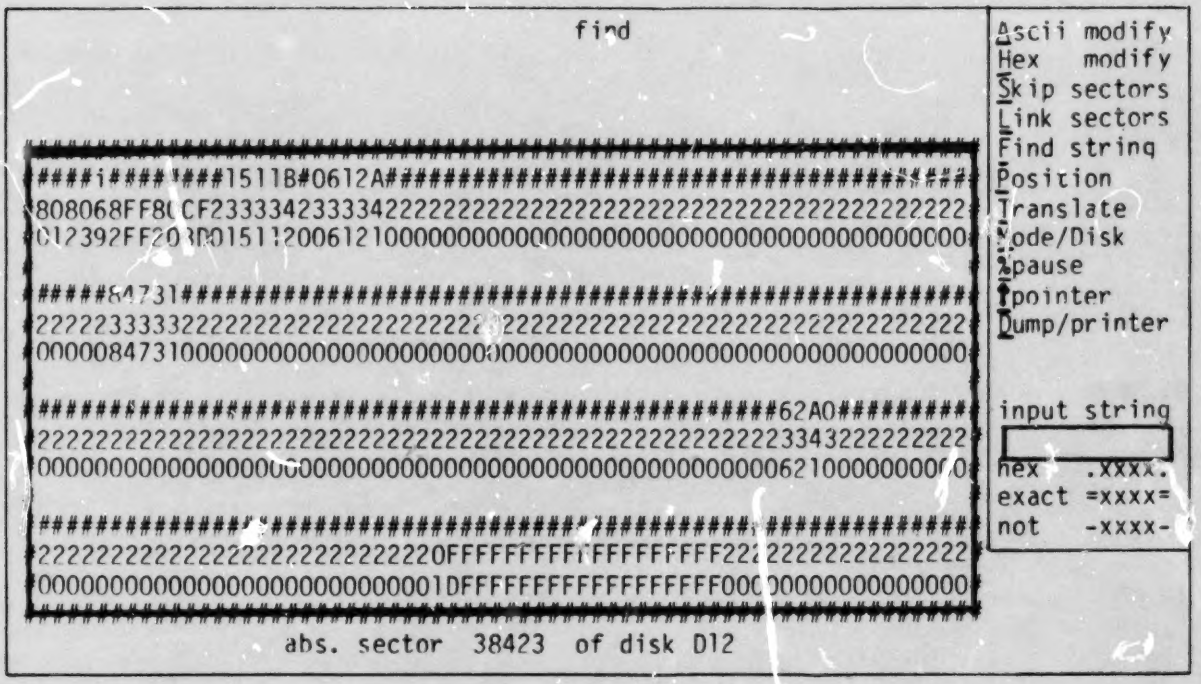

RRR LIRF range:[29890 to 34489] used:[4598 of 4599 = 99.98%]
link
Ascii modify
Hex modify
Skip sectors
Find string
Position
Translate
Mode/Disk
Pause
Pointer
next link
+00005
start byte
07
rel. sector 724 of RRR LIRF, abs. sector 30614 of disk D12

FIND A STRING OPTION

Selecting the Find a String Option will cause the system to display an image similar to the following if you are in the Relative mode:

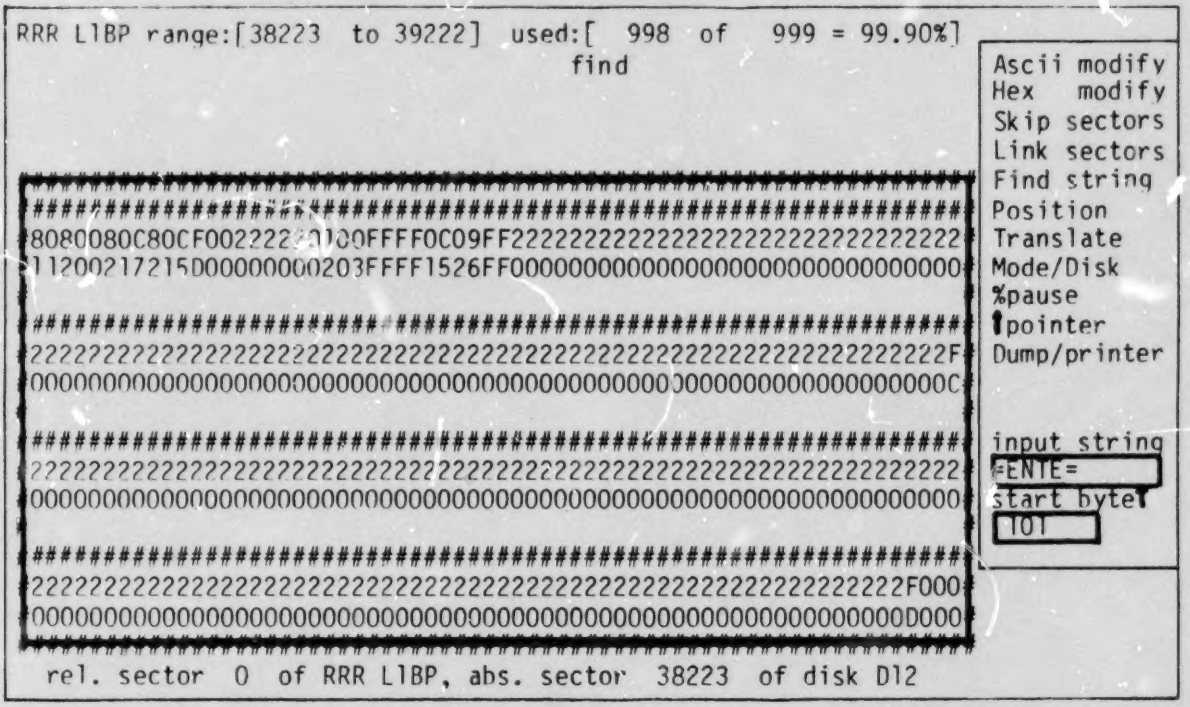


or, an image similar to the following if you are in the Absolute mode:

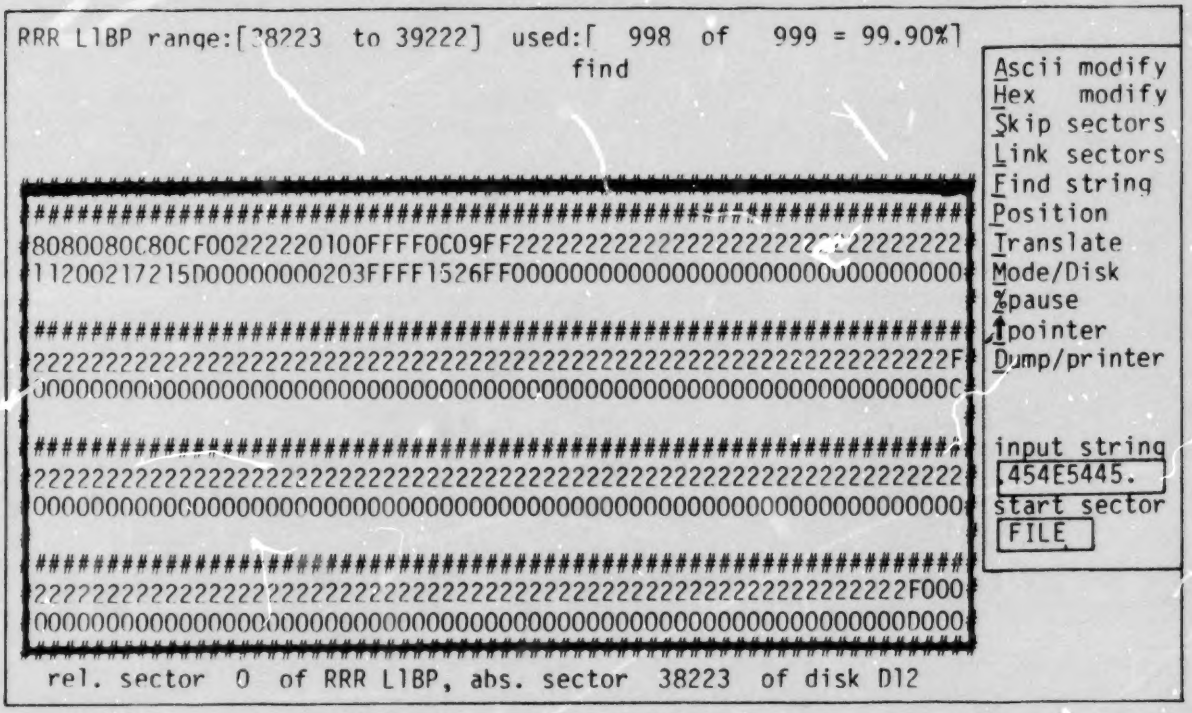


This option allows the user to locate an ASCII string (up to 64 characters) or a hexadecimal string (up to 62 hexadecimal digits). This option can find up to 1,000 occurrences with a maximum of 20 occurrences per sector. The user may specify the location of a string only at a certain byte position within the sector. The user may also find all occurrences where the string starting at a particular byte position is not the given string. Once an "F" is entered at the prompt at the top of the screen, a prompt will appear on the right side asking the user to input the string to locate. If a blank is entered, the user is returned to the normal viewing screen. If the string entered contains valid hexadecimal characters with a period (.) just before and after the string, then it is accepted as a hexadecimal string; otherwise, it is considered to be an ASCII string.

If the string (either hexadecimal or ASCII) has an equal (=) sign just before and after it, then it indicates the user would like to look for that string starting at a specified byte. A prompt will appear for that starting byte as shown below.

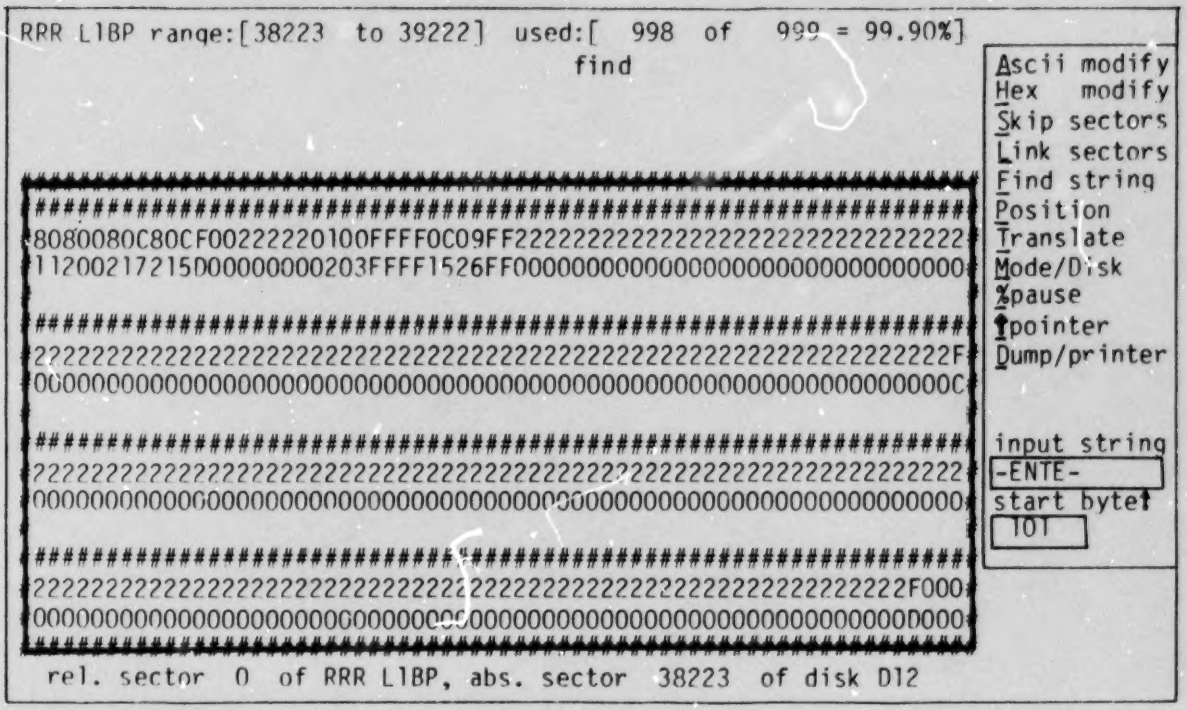


An example of inputting a hexadecimal string is shown below.



If the string (hexadecimal or ASCII) has a negative (-) sign just before and after it, then it indicates the user would like to find the occurrences, starting at a specified byte, that are not the input string.

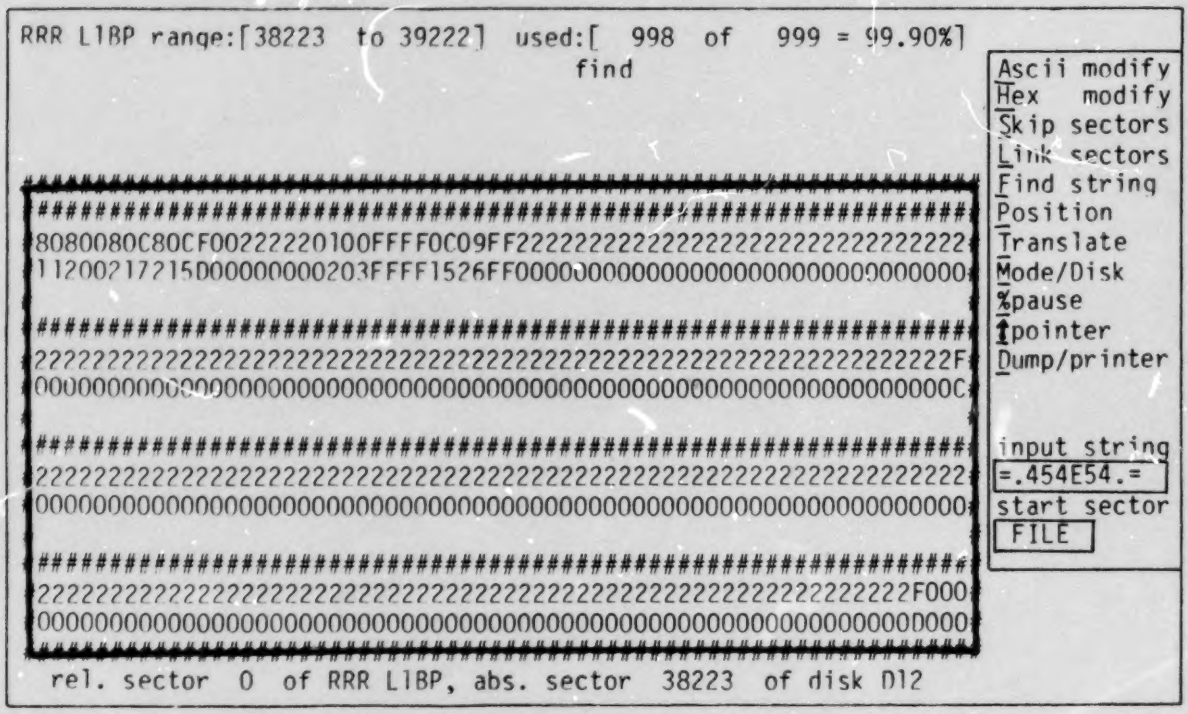
An example is shown below.



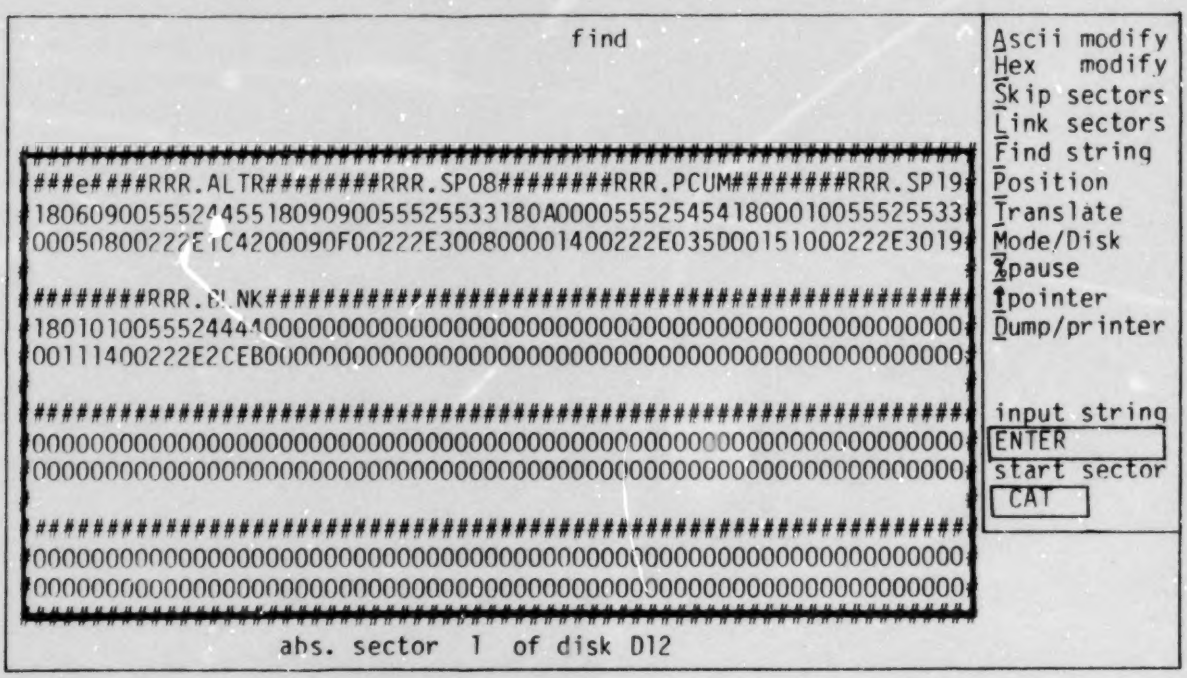
After the string has been entered, as well as the starting byte, if required, a prompt will occur below the input string. The user will be asked for the starting sector of the search. (This would be the starting relative sector if the user is in a Relative mode or starting absolute sector if the user is in an Absolute mode.)

At this prompt, the user may enter "file". If the user is in a Relative mode, then the parameters of the current file will become defaults. If the user is in an Absolute mode, the user may enter "cat", for catalog and the parameters of the disk catalog will become defaults, or "disk" may be entered and the parameters of the disk, other than the catalog, will become defaults.

This is an example of the Relative mode display:

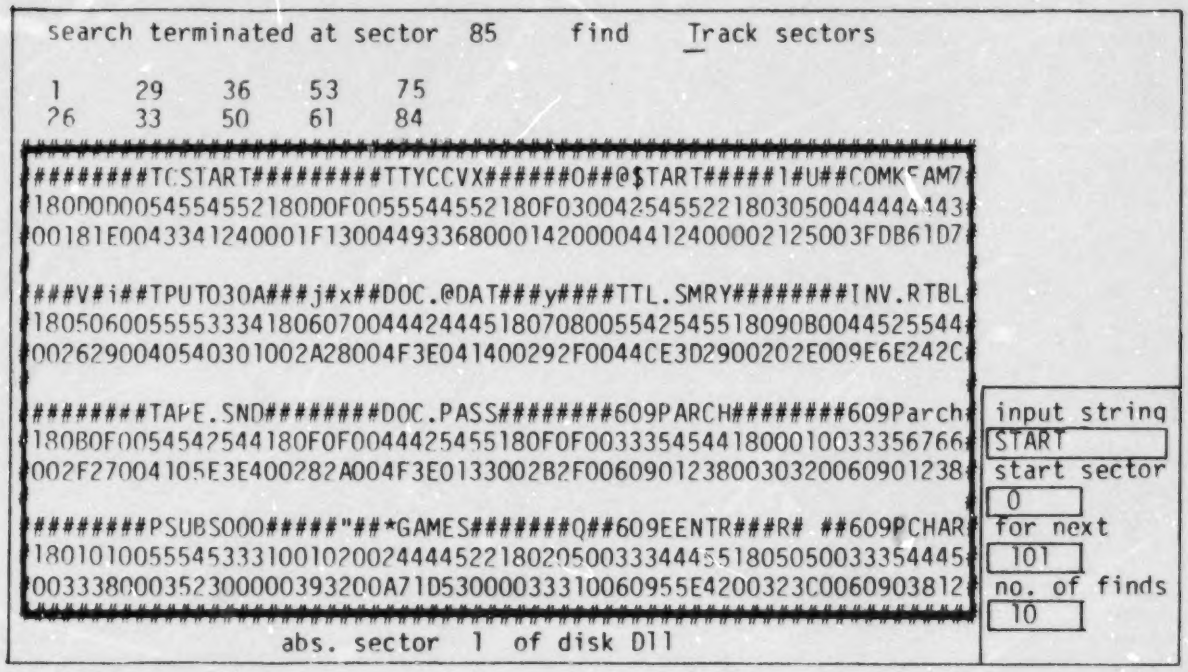


This is an example of the Absolute mode display:

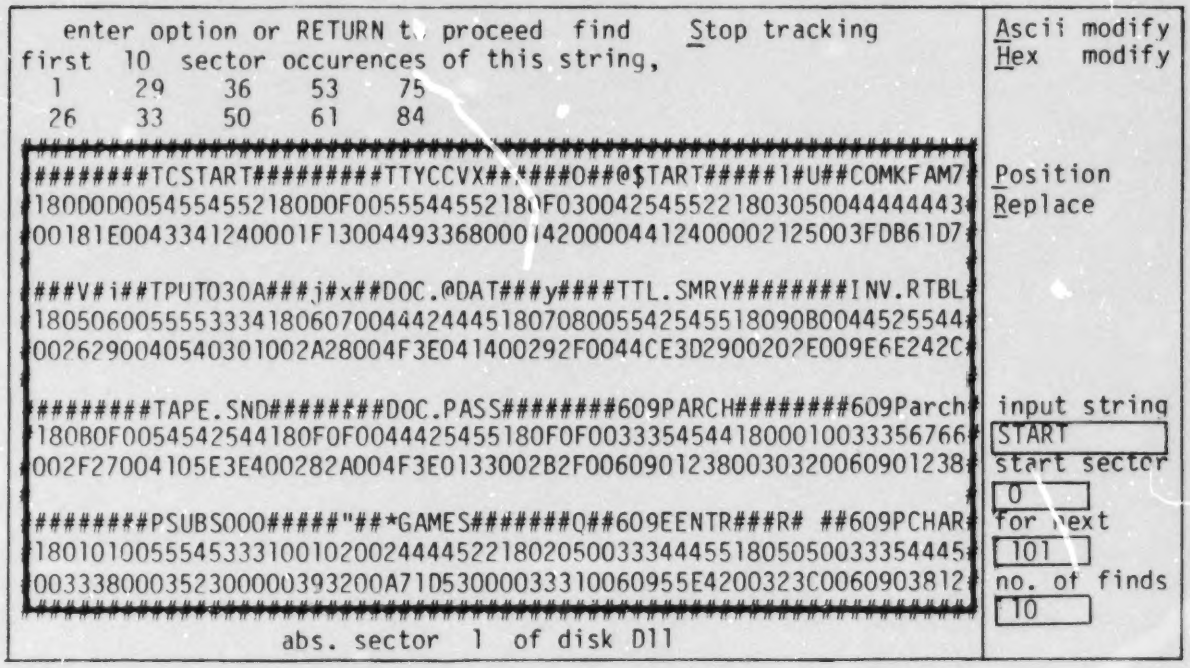


After a valid starting sector is entered, a prompt will appear just below it for the number of sectors to search. This number will default down to fit the file if the user is in a Relative mode and the number exceeds the file parameters, or, it will default down to fit the disk if the user is in an Absolute mode and the number exceeds the disk parameters. The next prompt asks for the number of finds. This number can have any value from one to 1,000. When a valid number is entered the search will begin. (Note: Entering a blank at any of the aforementioned prompts will cause the previous prompt to appear.) During the search, the top bar graph will display the percentage of the range searched and the small bar graph below it will display the number of finds, out of the number desired. Any key that is pressed during the search, except the RETURN key, will cause the number of the current sector being searched to be displayed. If the RETURN key is pressed, searching is halted. Pressing any key except the RETURN key will continue the search; pressing the RETURN key again will abort the search.

If nothing is found, the input string prompt will appear again. Entering a blank here will return the user to the normal viewing screen. If something was located, the sector numbers (up to a maximum number of 20) will be displayed at the top of the screen and a prompt will appear allowing the user to track sectors.



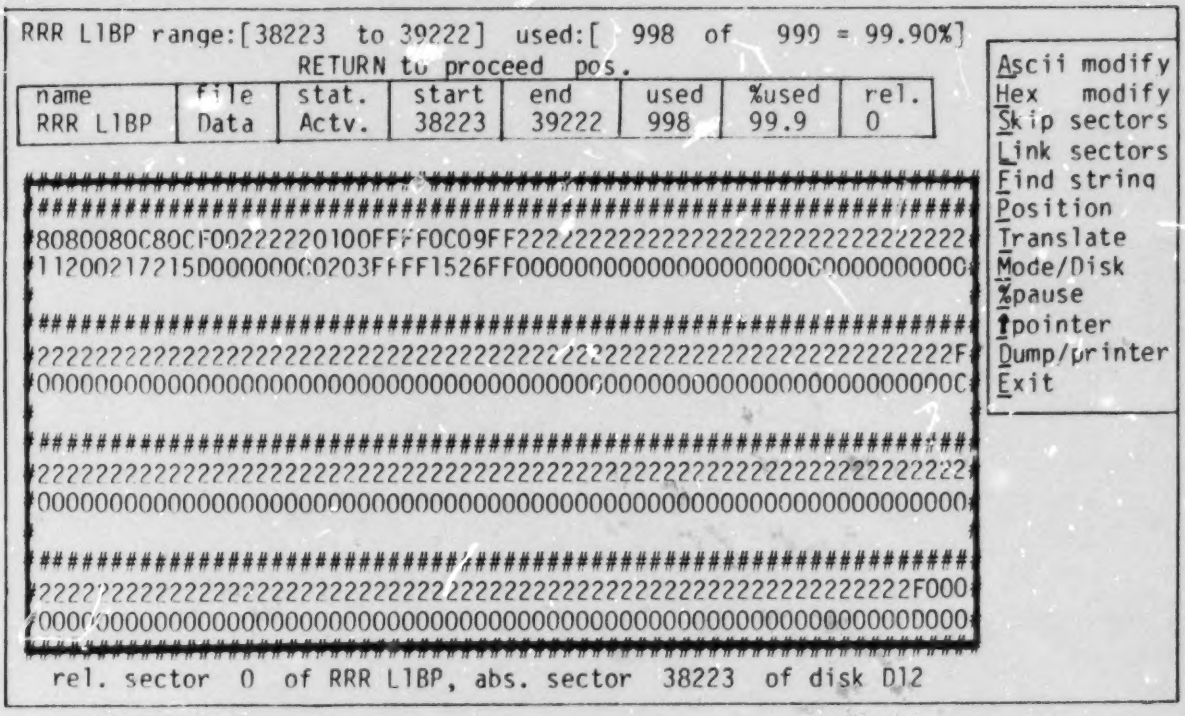
If a "T" is entered, the screen will begin displaying the sectors searched out, one at a time. To display the next located sector, press RETURN; to display the previous located sector, press BACKSPACE. To terminate the sector tracking, enter an "S" for Stop tracking. Any of the options listed on the right side of the screen can be used while tracking the located string.



REPLACE OPTION. This option can only be used while tracking a located string with the Find a String Option. Once an "R" is entered while tracking a located string, a prompt will appear along the right side asking what the located string is to be replaced with. This replacement string must not exceed the located string in length and must be hexadecimal if the located string is hexadecimal or ASCII if the located string is ASCII. Once the correct replacement string is entered, the replacement is accomplished and the user is returned to the normal tracking of the new string.

POSITION OPTION

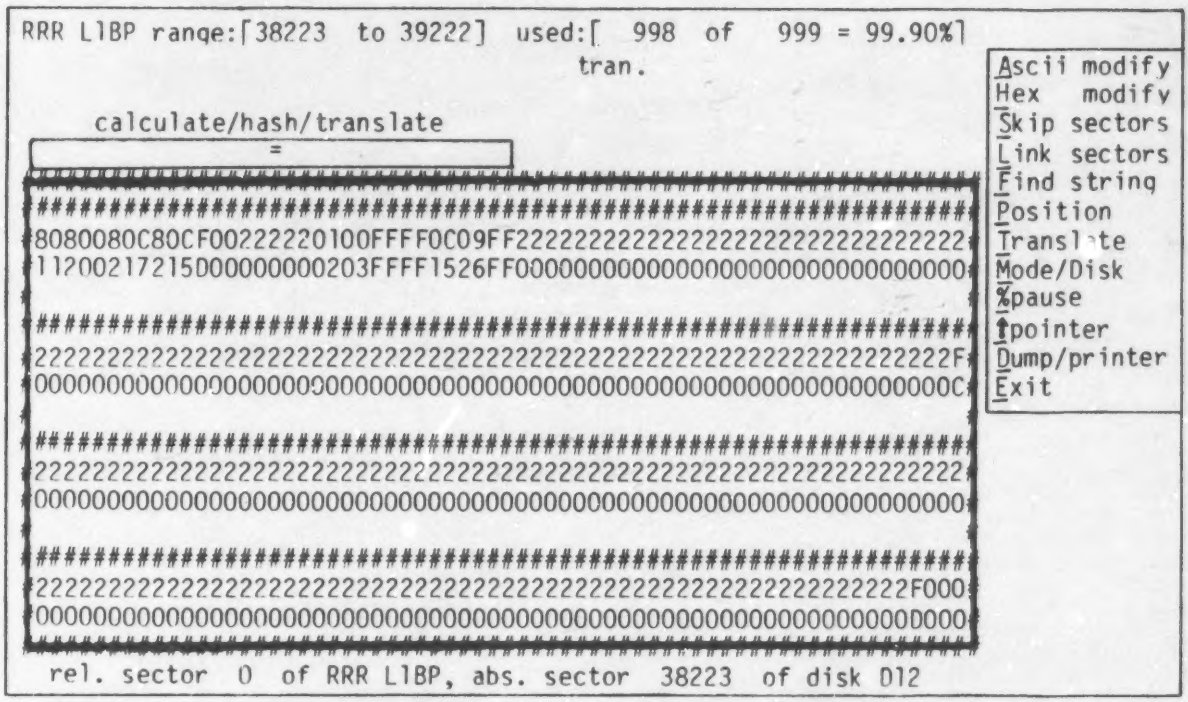
Selecting the Position Option will cause the screen to display:


RRR L1BP range:[38223 to 39222] used:[998 of 999 = 99.90%]
RETURN to proceed pos.
name | file | stat. | start | end | used | %used | rel.
RRR L1BP | Data | Actv. | 38223 | 39222 | 998 | 99.9 | 0
Ascii modify
Hex modify
Skip sectors
Link sectors
Find string
Position
Translate
Mode/Disk
%pause
↑pointer
Dump/printer
Exit
rel. sector 0 of RRR L1BP, abs. sector 38223 of disk D12

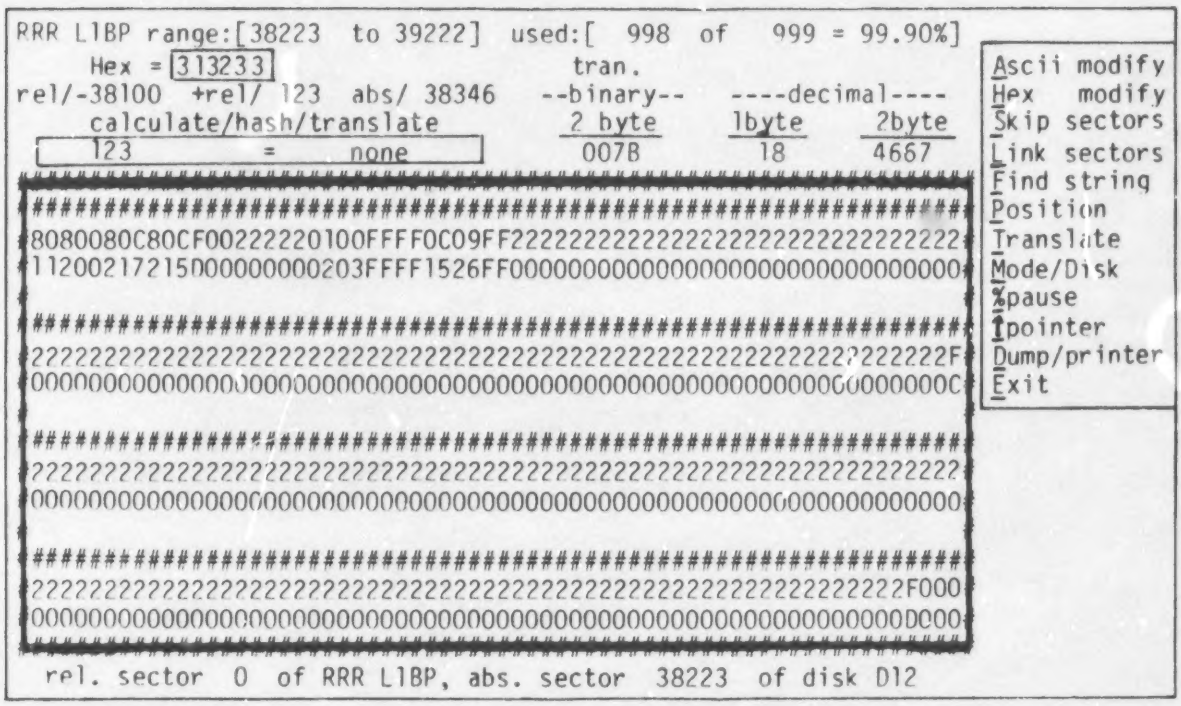
This option allows the user to locate the current sector displayed, as defined by the disk catalog. This option can be used in the Relative mode or Absolute mode; however, it is more useful in the Absolute mode since the user can be in any file and may not know which file is currently being displayed. Once a "P" is entered at the prompt at the top of the screen, a display will occur stating that the catalog is being searched. Shortly after this, the data from the disk catalog will be displayed across the top of the screen. If the user is tracking a located string with the Find a String Option and is in the catalog of the disk, the Position Option will state the user is in the catalog and state the catalog file information involving the located string. Press RETURN to return to the prompt at the top of the screen.

TRANSLATION OPTION

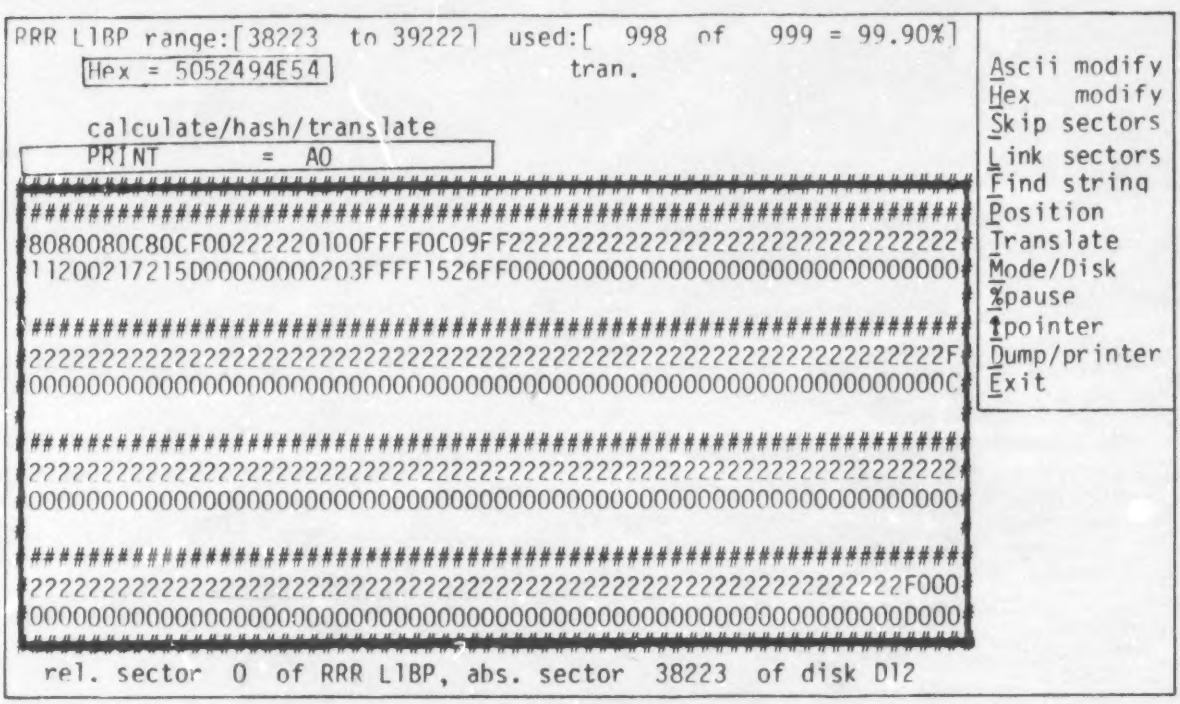
Selecting the Translation Option will cause the following screen to appear:



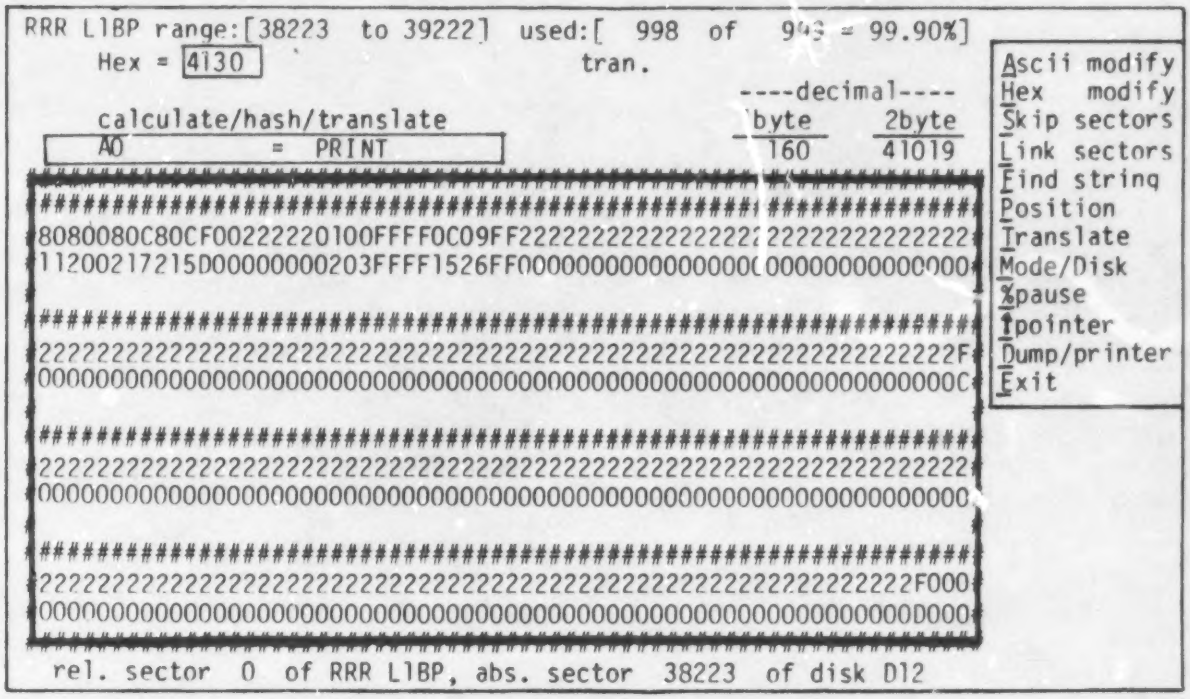
This option allows the user to perform various translations and calculations. Once a "T" is entered at the prompt at the top of the screen, a prompt will appear on the top left side asking for input. If a blank is entered, or if RETURN is pressed twice, the user returns to the normal viewing screen. If a number is input, it will be translated to hexadecimal, two byte binary hexadecimal, one and two byte decimal and relative/absolute sector addresses as shown following:



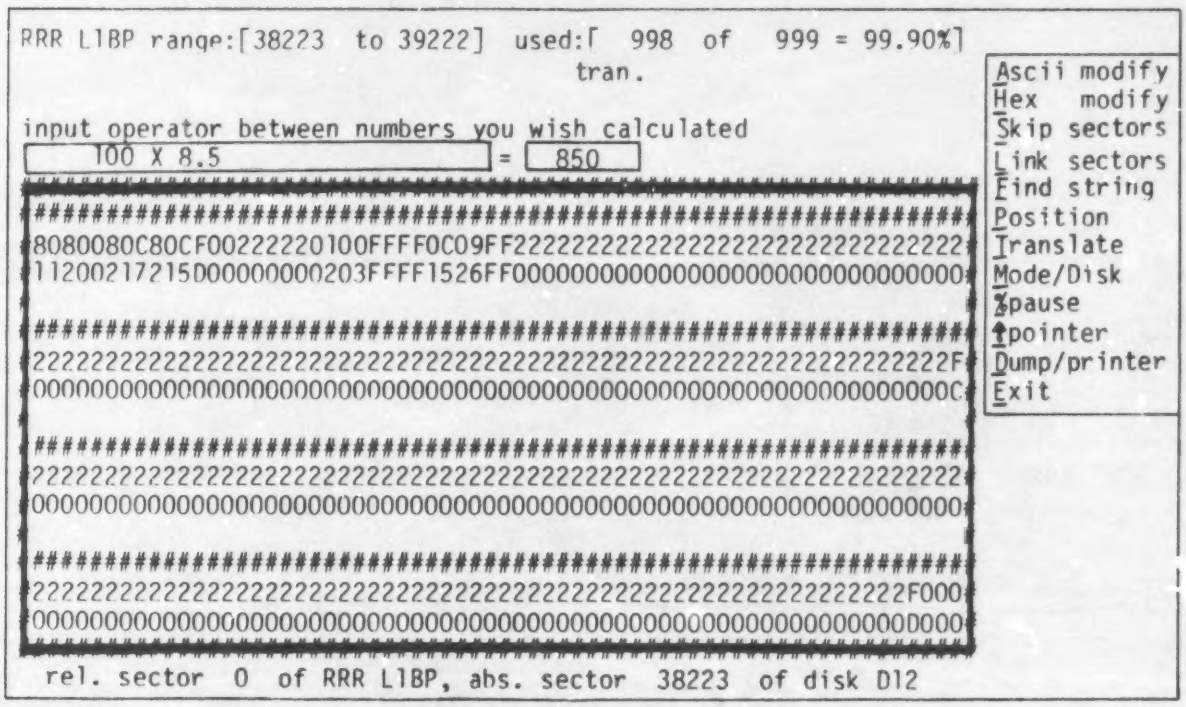
If a BASIC-2 reserve word or its hexadecimal equivalent is input, its complement will be given.



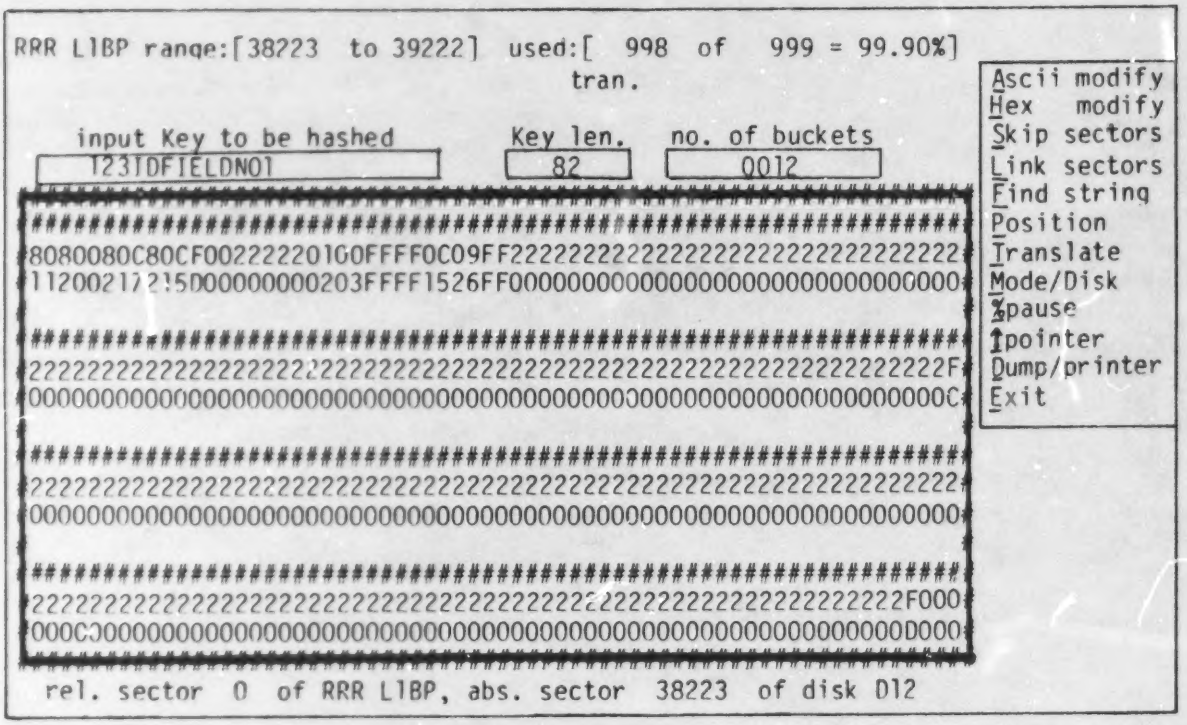
If a hexadecimal number is entered, its decimal number equivalent is given.



If "CAL" is entered, a new prompt is displayed and asks for some operator between two numbers. Only two numbers can be operated on at one time; however, there is no restriction on the number format or operator.



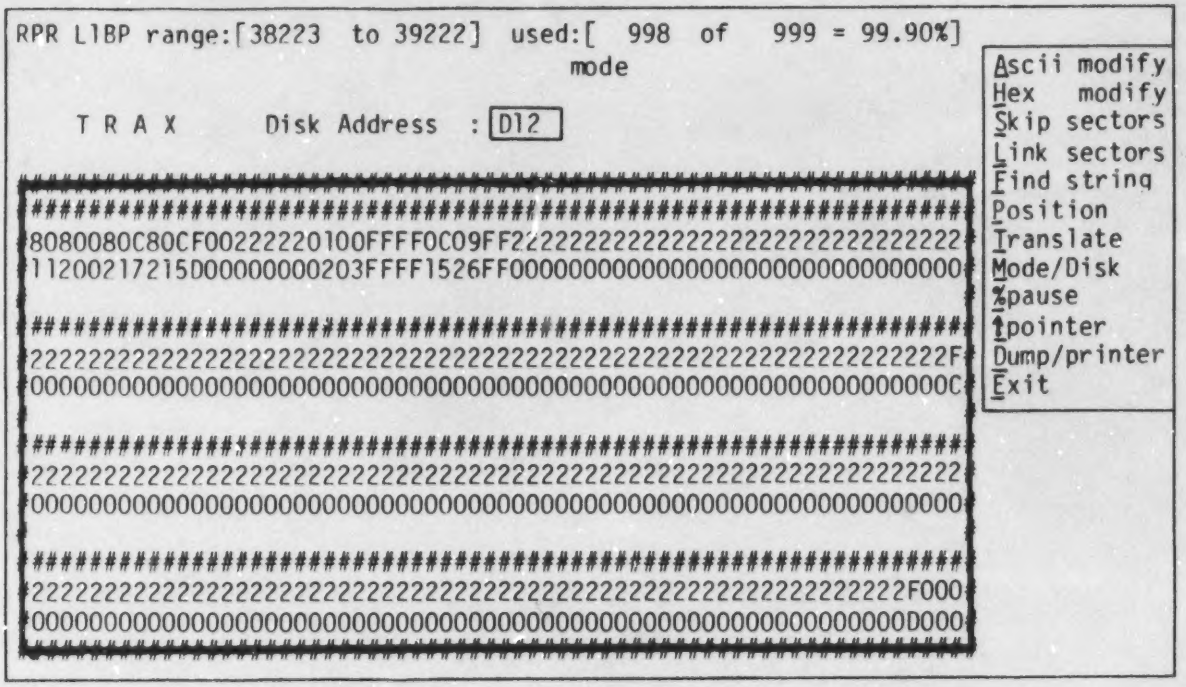
If "HASH" is entered, a new prompt is displayed and asks for some string to hash. (Note: Hash is the IDEAS 1 format.)



After the hash string has been entered, a prompt will appear for the desired length of the string to hash. This is followed by a prompt for the number of buckets in the data file (IDEAS 1). If the preceding data was entered correctly, the bucket number with the string in it and its relative sector address will be displayed across the top of the previously entered hash string. Entering a blank at any of the aforementioned prompts will cause the previous prompt to appear.

MODE OPTION

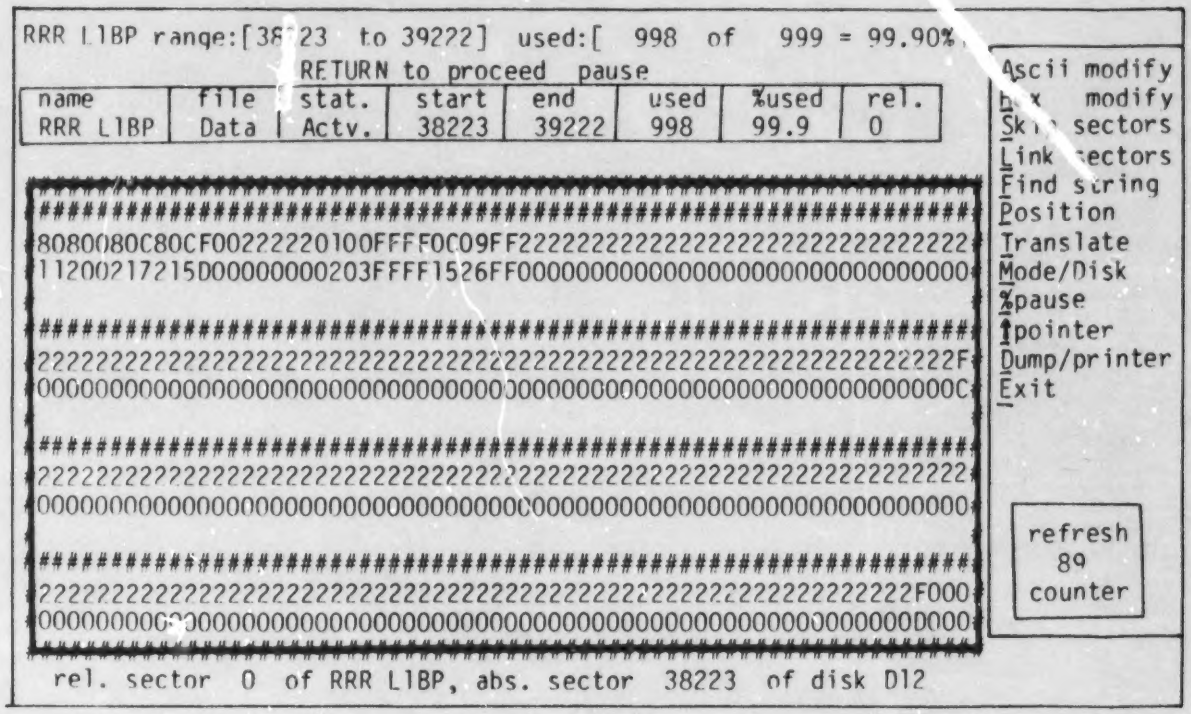
Selecting the Mode Option will cause the following display to appear:



This option allows the user to change the disk address and to choose between the Relative mode and Absolute mode. The procedure to follow is the same as when entering the TRAX program.

%PAUSE OPTION

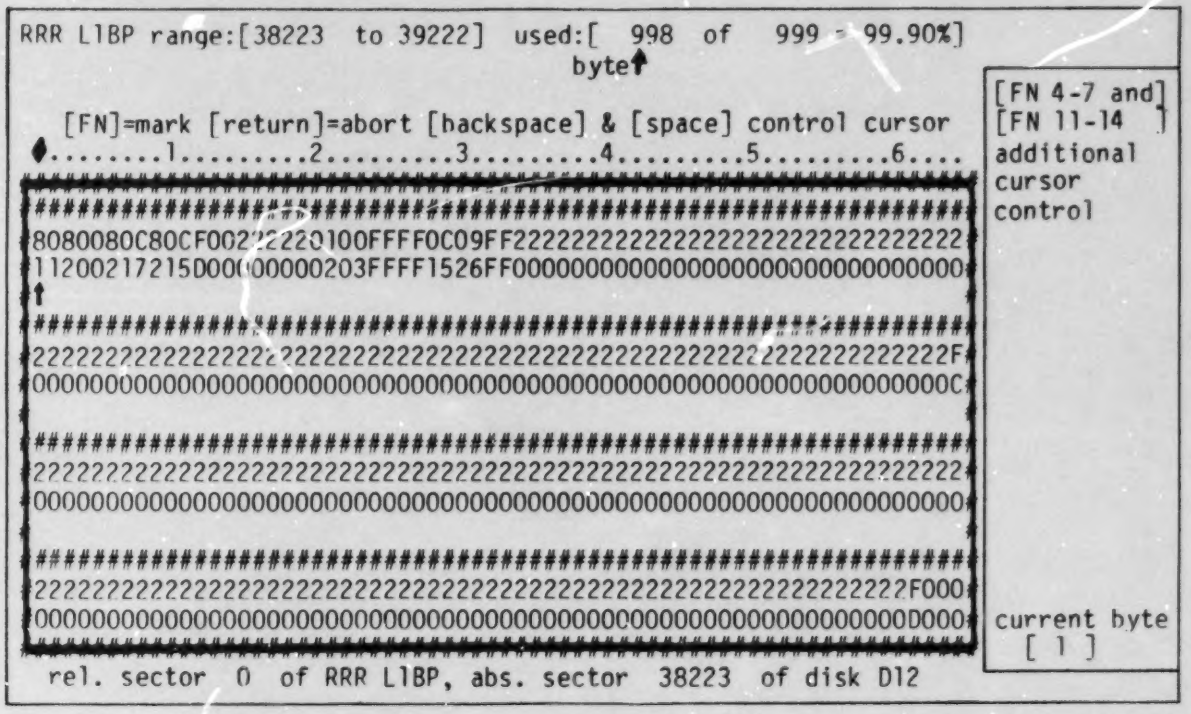
Selecting the Pause Option will cause the system to display:



This option allows the user to refresh the normal viewing screen approximately once each minute. (Note: Time varies with system usage and this does not utilize an MXE board in the CPU.) If the sector currently being viewed has changed by as little as one byte, this will be indicated under the counter on the lower right side of the screen. This option is useful in dealing with large sort data files or in testing some disk writing operation. Pressing RETURN will return to the normal viewing screen.

↑ POINTER OPTION

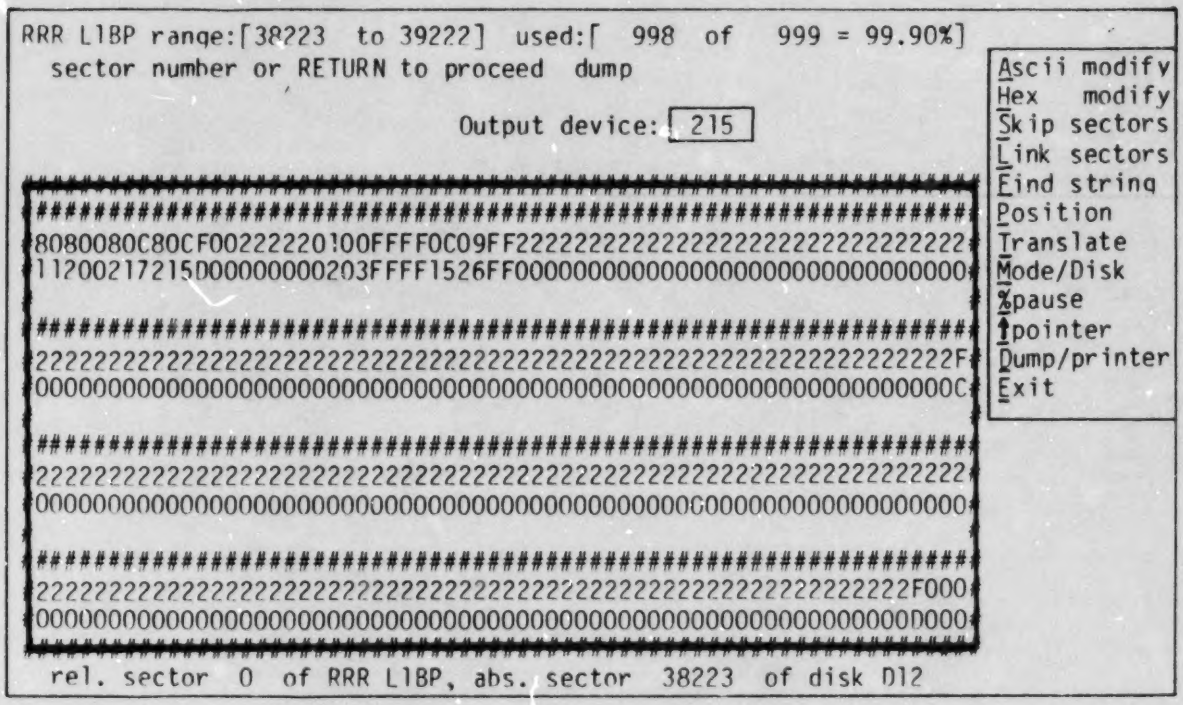
Selecting the Pointer Option will cause the following display to appear:



This option allows the user to place pointers at any byte displayed on the screen for easier reference and viewing. Once an " " is entered at the prompt at the top of the screen, the available options to place the pointer will appear. These control options for the pointer are exactly like the ASCII Modify and Hex Modify options, except that the CLEAR key and Special Function key 8 are not used.

DUMP/PRINTER OPTION

Selecting the Dump/Printer Option will cause a prompt to ask for a printer address as in the following display:



Once a correct printer address is entered, the current sector displayed will be printed at the printer specified.

EXIT OPTION

To exit the program enter, an "E" at the prompt at the top of the screen. Pressing Special Function key 31 will also exit from the program.

Technical Memorandum 84-1

DISTRIBUTION LIST

Navy

CNO (OP-01B7)
ONR (442 (3 copies), 270)
CHNAVMAT (MAT-0722)
CNET (01, 00A, 00A21, 00A2, L02)
CNTECHTRA (N-6 (2 copies))
CNATRA (Library (2 copies))
COMTRALANT (2 copies)
COMTRALANT (Educational Advisor)
COMTRAPAC (2 copies)
CO NAVPERSRANDCEN (Library (4 copies))
CO NAVEDTRAPRODEVCEN (Technical Library (2 copies), PDM)
CO NAVEDTRASUPPCENLANT (N-3 (2 copies))
CO NAVEDTRASUPPCENPAC (2 copies)
CO NAVTECHTRACEN Corry Station (101B, 3330, Cryptologic Training Department)
CO NAVTRAEQUIPCEN (TIC, 001, 002, 09P, 7)
CO NAVSUBTRACENPAC (2 copies)
CO NAVTECHTRACEN Treasure Island (Technical Library)
COMFLETRAGRU Pearl Harbor

Air Force

Air Force Human Resources Laboratory (Library), Brooks Air Force Base

Army

Commandant, TRADOC (Technical Library)
ARI (Technical Director, PERI-SM, PERI-IC, Library (2 copies))
ARI (Reference Service)

Coast Guard

Commandant, Coast Guard Headquarters (G-P-1/2/42, GRT/54)

Marine Corps

CGMCDEC
Director, Marine Corps Institute

Information Exchanges

DTIC (12 copies)
DLSIE
ERIC Processing and Reference Facility, Bethesda, MD (2 copies)

BEST COPY AVAILABLE